# Object Type Administration

The standard Predict metadata structure contains the following object types:
database, dataspace, extract, field, file, file relation, interface, keyword, library structure, method, network, node, packagelist, program, property, report listing, server, storagespace, system, trigger, user (owner), verification and virtual machine.

In addition to these predefined types, user-defined object types can be added to the Predict metadata structure.

User-defined object types are created and maintained with functions of the Object Type Administration Menu. Some administration functions of this menu can also be applied to predefined object types.

The Object Type Administration Menu is called by entering code O in the Metadata Administration main menu.

```
   09:55:00              *****  P R E D I C T  4.3.1  *****           2003-05-31
                         - Object Type Administration Menu -


                           Function

                           A  Add an object type
                           D  Display object type
                           S  Select object type
                           M  Modify object type
                           N  Rename object type
                           P  Purge object type
                           T  Modify attribute names and numbers
                           X  Cross reference object type

        Function .............

        Object type code ....*



        Command ===>
        Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
              -     -    Stop    -     -    Flip  Print  -     -     -     -    Main
```

| Parameters | |
|---|---|
| Function | Single-character code to select one of the functions available. The functions are described in the following sections:<br><br>● Add / Modify Object Type - Codes A, M<br>● Display Object Type - Code D<br>● Select an Object Type - Code S<br>● Rename an Object Type - Code N<br>● Purge an Object Type - Code P<br>● Modify Attribute Number - Code T<br>● Cross Reference Object Type - Code X |
| Object type code | Identifies the object type in Predict menus or direct commands, such as DA (database) or FI (file). |

# Add / Modify Object Type - Codes A, M

The Add and Modify functions use the same screens.

When an object type is added, a default extended description and help texts for retrieval and maintenance are generated. The default extended description can be changed using the function Modify Defaults which is called from the Function Main Menu with code D.

This section contains:

- Rules For Modifying Object Types
- First Screen
- Defining Attributes
- Defining Edit Masks
- Defining Verifications
- Defining the Header Layout

## Rules For Modifying Object Types

When an object type is modified the following rules apply:

- If an attribute is deleted, the attribute will be deleted in all existing objects of the object type.
- If an attribute is added or an attribute name is changed, the change will be applied to all existing objects of this type.
- The type of an attribute cannot be changed.
- For an attribute, the total number of positions may only be increased.
- If the number of positions is increased and the attribute has a verification or edit mask, the verification or edit mask will be deleted. This rule does not apply to the data types D (date) and T (time).
- If the verification or edit mask of an attribute is changed, the corresponding object data remain unchanged.

## First Screen

```
   13:54:15              *****  P R E D I C T  4.3.1  *****           2003-05-31
                         - Modify object type definition -

   Object type code ... CE                          Modified 2003-05-31 at 10:46
                                                              by MSZ

   Object type attributes                  Default association
     Internal code ... 1000005               Parent association .*
     Name ........... CHNG-ENHANCEMENT       Child association ..* DA
     Title .......... Chng-enhancement
     Object type no .* 1012000

   Edit owner ...............* D   Disallowed
   Edit description .........* F   Force
   Check description ........ Y   (Y,N)
   Object ID length ......... 32  (1-32)
   Disallowed characters .....
   Natural naming convention . N   (Y,N)

   Abstract   * Zoom: N
     Object-type to document
     change enhancements for pro-
   Screen number .... 1  of 1  (H=Header)                   Free attributes:  70
```

**Note:**
The parameters Internal code, Name and Title cannot be changed using the Modify function. To modify the Name or Title, use the function Rename object type.

| Parameters | |
|---|---|
| **Object type attributes** | |
| Internal code | This internal code is assigned automatically and cannot be changed. It is used by Predict to administrate object types. This field is empty when an object type is added. |
| Name | Name of the object type. A name<br><br>● must have at least three characters and start with a letter (a-z, A-Z).<br>● must not contain blanks.<br>● must be unique, and must not be an abbreviated form of an existing object type (for example, Key is not permitted because it could be confused with the predefined object type Keyword).<br>● must not start with an object type that already exists (for example, Filecard is not permitted). |
| Title | String that is used in Predict menus and output screens for the respective object type. Can be up to 17 characters long and contain numbers, special characters and blanks.<br>If no title is specified, the object type name with the first character capitalized will be taken as title. |
| Object type no | Number of the object type. When an object type is created, it is assigned a number between 1,000,000 and 4,999,999.<br>In the Modify function, this number can be modified. You can use the asterisk notation to select a number which has not yet been assigned to an object type, an association type or an attribute. |
| **Default association**<br>**These parameters can be changed for user-defined object types.** | |
| Parent association / Child association | The associations specified apply as default values in Predict functions for the in object type parameter (for example, in system parameter in maintenance screens of the user-defined object type change enhancement).<br>Only user-defined association types can be specified. |

**Note:**
The following parameters can be modified for both predefined and user-defined object types.

| Parameters | |
|---|---|
| Edit owner | Determines the handling of the owner list:<br><br>● **F**<br>Force: Only owners which are assigned to a user can be specified. At least one owner must be specified.<br>● **A**<br>Allow: the owner list can be edited.<br>● **D**<br>Disallow: the owner list must not be edited.<br><br>**Note:**<br>For the object type User, the parameter Edit owner can only be set to Disallow if it has not been set to Force for any other object type.<br>If the parameter Edit owner is set to Force for any object type, Predict does not check whether all objects of this type have an owner in their owner lists. |
| Edit description | Determines the handling of the extended description:<br><br>● **F**<br>Force: at least three lines must be specified.<br>● **A**<br>Allow: the extended description can be modified.<br>● **D**<br>Disallow: the extended description must not be modified. |
| Check description | Parts of an extended description skeleton can be protected (see Extended Description Skeleton). If this parameter is set to Y, the protected text must be contained in the extended description. |
| Object ID length | Enter a value from 1 - 32. The value entered here is the maximum length of an ID for objects of this type. |
| Disallowed characters | Up to 20 characters that are not allowed in IDs for objects of this type can be entered here.<br><br>**Note:**<br>Object ID length and disallowed characters can be checked with Special Function Consistency of Predict > Check naming conventions. See Check Naming Conventions. |
| Natural naming convention | **N**<br>Default. Predict naming conventions apply. See Naming Conventions in the **Predefined Object Types in Predict documentation**.<br><br>**Y**<br>Natural naming conventions apply to object IDs. These conventions support use of double-byte character sets (DBCS). See your **Natural documentation** for further information. |

**Note:**
The parameters above can be modified for existing object types, but checks are only performed on newly created objects or objects imported with the Predict Coordinator.

For example:
You can change the parameter Object ID length for object type database to 30 even if databases exist with an ID of 32 characters.

| Parameters | |
|---|---|
| Abstract | An abstract of up to 16 lines can be specified. Each line can contain up to 30 characters. |
| Screen number | Up to five maintenance screens can be defined for each object type. When a number between 1 and 5 is entered, the corresponding screen for attribute definition is selected. Only an existing screen or the next free screen can be selected.<br><br>If zero is entered, the Metadata Administration menu appears.<br>If 'H' is entered, the header is displayed. |
| Free Attributes | The remaining number of free attributes is displayed - a maximum of 80 for each object type. |

## Defining Attributes

Up to 80 attributes can be defined for each object type - a maximum of 40 in one maintenance screen. The maximum numbers of attributes for the individual attribute types are:

alphanumeric: 40; numeric: 40; date, time, logical, and literal 20 each.

```
   13:04:08              *****  P R E D I C T  4.3.1  *****            2003-05-31
                         - Modify object type definition -

   Name .......... CHNG-ENHANCEMENT                    Modified 2003-05-31 at 10:46
   Screenname .... Attributes                                by MSZ
   Screennumber .. 1
                                                   Positions of
                                              Title       Value
      Attribute Name                Fmt Len Case Li/Col    Li/Col   Lit Ext Ver
                                                                      *
    1  Customer                      A   58   L   1   1     1   20
    2  Title                         A   58   L   2   1     2   20
    3  Version                       A    6   U   4   1     4   20               T
    4  Subproduct                    A   20   L   3   1     3   20
    5  Status                        A    1   U   6   1     6   20               R
    6  Test                          A    1   U   8   1     8   20               S
    7  Closing-date                  N  8.0       7   1     7   20
    8  CE-Nr                         N  6.0       5   1     5   20
    9  time                          T           10   1    10   20
   10  date                          D           12   1    12   20

     Test screen layout: N                    More:    Attributes: N
```

| Parameters | |
|---|---|
| Screen name | Name of the corresponding maintenance screen. If several maintenance screens are existing, the screen names are displayed in a selection window. Up to 17 characters are allowed.<br>Default value for the first screen name is Attributes. |
| Attributes | Names of the attributes which are to be displayed in the corresponding maintenance screen for this object type. Up to 32 characters are allowed. |

| Fmt | Format of the attribute:<br><br>**A**<br>alphanumeric<br><br>**D**<br>date<br><br>**L**<br>logical<br><br>**N**<br>numeric<br><br>**T**<br>time<br><br>**X**<br>literal |
|---|---|
| Len | The length of an attribute value depends on the format:<br><br>**A**<br>1 to 78<br><br>**N**<br>1 to 27 places before the decimal point, and 0 to 7 places after the decimal point, where the total number of places must not exceed 27 |
| Case | This field is only valid for alphanumeric attributes (type A).<br><br>**U**<br>The attribute value is converted to capital letters.<br><br>**L**<br>No conversion to capital letters. |
| Position of Title | The position refers to a window of 15 lines and 78 columns:<br><br>• line ($1 \leq$ line $\leq 15$)<br>• column ($1 \leq$ column $\leq 78$)<br><br>The attribute name is not displayed if both values are 0. The position must be defined for type X (literal). |
| Position of Value | The position refers to a window of 15 lines and 78 columns:<br><br>• line ($1 \leq$ line $\leq 15$)<br>• column ($1 \leq$ column $\leq 78$)<br><br>For type X (literal), this field must remain empty. |
| Lit | SMR |

| Ext | Extended attribute description. Subsequent screens for the definition or modification of edit masks and verifications for the attribute are displayed.<br><br>**E**<br>edit mask (only for types D, L and T)<br><br>**T**<br>table of verification values<br><br>**R**<br>range of verification values<br><br>**S**<br>external verification (special check)<br><br>For type X (literal) neither edit masks nor verifications can be defined; for type L (logical) no verifications can be defined.<br><br>The following default values apply to edit masks:<br><br>**L**<br>F/T<br><br>**D**<br>YYYY-MM-DD<br><br>**T**<br>HH:II:SS<br><br>Changing the verification type (T, R or S) is possible. In this case, the old verification is deleted. Before deletion, a warning is displayed. The corresponding object data remain unchanged.<br><br>**Note:**<br>Entries in the Ext fields can only be processed for one attribute. If values for several attributes are entered, an error message is displayed. |
|---|---|
| Ver | An existing verification type (T, R or S) is displayed for the attribute.<br><br>**Note:**<br>The verification is not performed by the link editor, if the attribute name is not defined in the header layout (as described in the section Defining the Header Layout). |
| Test screen layout | **Y**<br>The maintenance screen is displayed to test the screen layout. |
| More Attributes | **Y**<br>Each definition screen can contain ten attributes. If more attributes are to be defined (up to 40), this field is used to display a subsequent screen. |

## Defining Edit Masks

For the attribute types L, D and T (logical, date and time) edit masks are defined. Enter E in the field Ext to display a selection window where you can select an appropriate edit mask for the attribute. The following values are possible:

| Attribute Type | Value |
|---|---|
| L (Logical) | FALSE/TRUE |
| | OFF/ON |
| | NO/YES |
| | N/Y |
| | * F/T |
| D (Date) | DD/MM/YY |
| | DD.MM.YY |
| | YY-MM-DD |
| | DD/MM/YYYY |
| | DD.MM.YYYY |
| | * YYYY-MM-DD |
| | MM/DD/YYYY |
| | YYYYMMDD |
| T (Time) | * HH:II:SS |
| | HH:II:SS:T |
| | HH:II:SS AP |
| | HH:II:SS:T AP |

Asterisks indicate the active edit mask for the attributes.

# Defining Verifications

There are three methods of performing plausibility checks for object attributes:

- using a Table of Values
- using a Range of Values
- using an External Routine.

**Defining a Table of Values**

Enter T in the field Ext to define a table of values.

```
   13:09:01              *****  P R E D I C T  4.3.1  *****              2003-05-31
                         - Add a Table Definition -

   Name ............ CHNG-ENHANCEMENT                  Modified 2003-05-31 at 10:46
   Attribute name .. datum                                     by MSZ


   EDIT MASK ....... YYYY-MM-DD


   Required ........ N (Y/N)
    1 1993-01-01   2 1994-01-01
    3 1995-01-01   4
    5              6
    7              8
    9             10
   11             12
   13             14
   15             16
   17             18
   19             20
   21             22
   23             24
```

| Parameters | |
|---|---|
| EDIT MASK | Active edit mask for the attribute (only for types D, L and T). |
| Required | **Y** Attributes for which a verification rule with a table of values has been defined must be filled in maintenance screens (mandatory fields). Attributes with a verification rule that allows blank values need not be filled explicitly. <br> Use the following 24 fields to define the verification values. |

**Defining a Range of Values**

Enter R in the field Ext to define verifications with ranges of values.

```
   13:13:48              *****  P R E D I C T  4.3.1  *****              2003-05-31
                          - Add a Range Definition -

 Name ............ CHNG-ENHANCEMENT                   Modified 2003-05-31 at 10:46
 Attribute name .. date                                     by MSZ

 EDIT MASK ....... YYYY-MM-DD
 Required ........ N (Y/N)

 Range of values *:

  GT 1994-01-01                        AND   LT DATE____

                                       OR_

  GT 1993-01-01                        AND   LE 1993-03-31

                                       ___

  __ _____                          ___  __ _____

                                                     Error code: ____
```

| Parameters | |
|---|---|
| EDIT MASK | Active edit mask for the attribute (only for types D, L and T). |
| Required (Y/N) | **Y** Attributes for which a verification rule with a range of values has been defined must be filled in maintenance screens (mandatory fields). Attributes with a verification rule that allows blank values need not be filled explicitly. |
| Range of values | In the following fields, you can define ranges of values according to the following syntax:<br><br>AA  Value_1  BBB  AA  Value_2<br><br>            CCC<br><br>AA  Value_3  BBB  AA  Value_4<br><br>            CCC<br><br>AA  Value_5  BBB  AA  Value_6<br><br>For any defined Value_X, **AA** is a mandatory field with one of the following possible values: **EQ** (equal), **NE** (not equal), **LT** (less than), **LE** (less than or equal), **GT** (greater than), **GE** (greater than or equal). If you enter an asterisk, the possible values are displayed in a selection window.<br><br>Value_X are the verification values. Up to six verification values can be defined.<br><br>For type **A** (alphanumeric), the length is restricted to 32 - independent of the length of the attribute itself.<br>For type **N** (numeric), the following applies: a maximum of 20 digits before and 7 digits after the decimal point can be entered.<br><br>If DATE is entered for type **D** (date), the verification value is the current date.<br><br>**BBB** is one of the possible values AND or OR which combines the two elementary conditions of one line in a boolean expression.<br><br>**CCC** combines the boolean expressions defined in each line with the operand AND or OR. The logical expressions are always processed line by line.<br><br>    **Note:**<br>    The logical consistency of the verification rule is not checked. |
| Error code | User-defined, verification-related number of the error message which appears if an invalid attribute value has been entered. Range of values: 9000 - 9999. |

**Note:**
With attributes of type A (alphanumeric) only the number of positions defined in the verification rule are considered.

**Using an External Routine**

Enter S in the field Ext to define that an external verification rule is to be called.

```
   13:34:17              *****  P R E D I C T  4.3.1  *****              2003-05-31
                         - Add a Special Check -

 Name ............ CHNG-ENHANCEMENT                     Modified 2003-05-31 at 10:46
 Attribute name .. Test                                       by MSZ


 Subprogram ... N-TEST__


 Attribute names *
  Customer_____
  Version_____
  _____
```

| Parameters | |
|---|---|
| Subprogram | Name of the subprogram which is called to verify the attribute value. |
| Attributes | In the following fields, you can define up to three object attributes, which are defined in one maintenance screen, as input parameters for the subprogram. If you enter an asterisk, the names of the object attributes of this maintenance screen are displayed in a selection window. |
| | Attributes of type X (literal) cannot be defined as input parameters for the subprogram. |
| | The values of these attributes are passed to the defined subprogram in alphanumeric format (length 78) as follows: |
| | <ul><li>type A: left aligned with leading blanks. If Case = U, letters are converted to capital letters.</li><li>types D and T: right aligned according to their internal representation.</li><li>type L: left aligned; "1" for TRUE and "0" for FALSE.</li><li>type N: right aligned without decimal point. All places after the decimal point (according to the attribute definition) are passed. The number of places after the decimal point is passed by an additional parameter. With negative values, the sign is passed as well. Leading zeros are suppressed.</li></ul> |
| | The following CALLNAT statement is generated: |
| | **CALLNAT 'subprogram'**<br>**PAR1 PAR2 PAR3**<br>**RETURN-CODE RETURN-TEXT1 RETURN-TEXT2** |
| | **PAR1 PAR2 PAR3**:<br>values of the attributes (format A78); |
| | **RETURN-CODE**:<br>number of a Predict error message (format I2); RETURN-TEXT1 and RETURN-TEXT2: texts as parameters for this error message (format A34). |
| | In the subprogram, attribute values of the types D, N, and T can be converted using the Natural function VAL. |
| | The verification rules are processed screen by screen. Independent of the sequential numbers of the attributes to be verified, the verification rules with external verification routines are processed last - they are only processed after all verification rules with tables of values and ranges of values have been processed. |

## Defining the Header Layout

```
    13:43:42            *****  P R E D I C T  4.3.1  *****              2003-05-31
                          - Modify Header Layout -

    Object type ..... CHNG-ENHANCEMENT



          Number of:  Column   Header                              Length  Format
          Attr. Scr.
    1.      2    1      1       Title                                 19    A   58
    2.      7    1     21       C-date                                 9    N  8.0
    3.
    4.

    Layout:                                        ....+....1....+....2....+....3....+....4

        Chng-enhancement                     Title              C-date
        ------------------------------       ------------------ ---------


```

This screen appears after object attributes have been defined. Here you can define a table layout to be used by the maintenance functions List, Select and Link children.

The following rules apply:

- A maximum of four rules can be specified.
- The total length of all attribute values must not exceed 30 characters (including blanks to separate the columns).
- The text of the header lines can be modified as desired.
- The display length can only be modified for alphanumeric attributes.

| Parameters | |
|---|---|
| Number of Attr. | Number of the attribute in the definition screen. |
| Number of Scr. | Number of the definition screen of this attribute. |
| Column | Position in the table screen. |
| Header | Text of the header line in the table screen. |
| Length | Length with which the value is displayed.<br><br>**Note:**<br>If the display length is less than the length of the header text, the attribute value is displayed with the length of the header text. |

# Display Object Type - Code D

Displays object type definitions in an output format similar to the screens used for adding or modifying object type definitions. For a description of all output fields, see Add / Modify Object Type.

# Select an Object Type - Code S

A list of predefined and user-defined object types is displayed for selection. Press ENTER to display the next page.

```
  13:36:14              *****  P R E D I C T  4.3.1  *****           2003-05-31
                          - Select Object Type Definition -

  Mark Code  Title              Object type


        CH    Child              CHILD
        CE    Chng-enhancement   CHNG-ENHANCEMENT
        DA    Database           DATABASE                          predefined
        DK    Dokument           DOKUMENT
        EL    Elementary field   ELEMENT                           predefined
        EY    Elementary field   EMPTY
        FI    File               FILE                              predefined
        UP    File               FILL
        HI    Verif              HIT
        HO    Keyword            BWG1
        JB    Owner              JOB
        KY    Keyword            KEYWORD                           predefined
        NO    Node               NODE                              predefined



  Hit the corresponding PF-KEY to STOP, Enter 'X' to ABORT or 'T' for TOP : _
```

# Rename an Object Type - Code N

```
  09:44:42              *****  P R E D I C T  4.3.1  *****           2003-05-31
                          - Rename Object Type Definition -

  Name ............ CHNG-ENHANCEMENT                Modified 2003-05-31 at 07:32
  Object type ..... CE                                        by ARH

  Object type attributes
    Intern code.... 1000005
    Title.......... Chng-enhancement

  New attributes
    New name ........ CHNG-ENHANCEMENT    ( '.' to return to menu )
    New object type .. CE
    New title........ Chng-enhancement


            ---------------- ATTENTION -----------------
            Contents of help-texts and default description
            will not be adapted.
```

The name of the object type, the external code, and the title can be changed.

# Purge an Object Type - Code P

Deletes a user-defined object type and all data dictionary objects of this type. The following rules apply:

- Object types that are linked to another object type by an association cannot be purged.
- The default extended description and the help texts for retrieval and maintenance are deleted.

# Modify Attribute Number - Code T

```
   13:22:39              *****  P R E D I C T  4.3.1  *****              2003-05-31
                         - Modify attribute number -

   Name ........ Parent_of_H1                      Modified 2003-05-31 at 13:30
                                                              by HEB


   Cnt  Number   Attribute name                    title
   ---  *------  --------------------------------  --------------------------------
     1  2000082  SCREEN_1                          Screen 1
     2  2000077  BLAB01                            Blab01
     3  2000078  BLAB02                            Blab02
     4  2000079  BLAB03                            Blab03
     5  2000080  BLAB04                            Blab04
     6  2000081  BLAB05                            Blab05
     7  2000130  SCREEN_2                          Screen 2
     8  2000001  ALPHA_2-1                         Alpha_2-1
     9  2000003  ALPHA_2-10                        Alpha_2-10
    10  2000131  SCREEN_3                          Screen 3
    11  2000002  ALPHA_3-1                         Alpha_3-1
    12  2000005  ALPHA_3-12                        Alpha_3-12
    13  2000132  SCREEN_4                          Screen 4
    14  2000010  SS                                ss
```

**Number of the attribute**

When an attribute is added, it is assigned a number between 1,000,000 and 4,999,999. This value can be modified. You can use the asterisk notation to select a number which has not yet been assigned to an object type, to an association or to an attribute.

# Cross Reference Object Type - Code X

Displays the following information on the associations of the object type:

- all object types to which the object type is linked
- all retrieval models defined for the object type
- all retrieval models that report on links to the object type.